

**ABSTRACT FOR THE 33RD COSPAR  
SYMPOSIUM B0.5 (Io: the Volcanic "Heart" of the Jovian System).**

**CURRENT CONSTRAINTS ON IO'S HEAT FLOW**

D. L. Matson (1)

(1) Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA  
91106, USA

The results from the Galileo mission have opened a new era in the study of Io's heat flow. We are now able to see directly how heat is brought to the surface by molten lava. This allows better modeling of Io's several styles of eruptions. The new data also allow us to validate much that was inferred previously on the basis of Voyager and ground-based data sets. However, the big advances are more qualitative than quantitative. The wavelength coverage of the several types of Galileo data is restricted and the amount of data actually returned to the ground is severely limited by the slow transmission rate. Fortunately, observations from the ground and from Earth-orbit can fill these gaps. They provide good wavelength coverage of Io's thermal emission spectrum, they monitor changes with time, and they cover almost all of Io's surface. While it will be some time before all of the new data can be digested into a determination of heat flow, it is possible to make a preliminary estimate. The lower limit on Io's heat flow is:  $6 \times 10^{13}$  W. Assuming the eruption of lava as the mechanism for the heat flow allows one to set an upper limit of  $2.2 \times 10^{14}$  W. This work has been carried out under contract with NASA.